

REMARKS

The rejection of Claims 1-8 under 35 U.S.C. § 103(a) as unpatentable over US 6,579,977 (Pieschel et al) in view of US 4,981,515 (Hiroka et al), is respectfully traversed.

Pieschel et al, which is from the same patent family as WO 99/28372, as can be confirmed by the cover page thereof, is described in the specification herein as Patent Document 2 [0008], and as describing a method for enhancing the mechanical strength of fibers by using sulfur powder upon production of cellulose phosphate [0007]. Particularly, Pieschel et al discloses a process for producing biosorbents by phosphorylation of cellulose-containing materials with phosphoric acid or ammonium phosphate in the presence of urea (column 1, lines 9-12). However, as recognized by the Examiner, Pieschel et al does not disclose the use of cellulose II as the source of their cellulose. Indeed, as Applicants disclose in the specification at [0008], cellulose exists in four polymorphs ranging from polymorph I, which is a natural cellulose, to polymorph IV. Cellulose I phosphate is available from the phosphorylation of natural cellulose, such as disclosed in Pieschel et al, but the phosphorylation product of cellulose II is not known.

Hiroka et al discloses a regenerated cellulose composition having a high functionality, containing active carbon (column 1, lines 7-11). Hiroka et al acknowledges that such compositions are adsorptive but Hiroka et al is concerned also with flammability, and discloses that it is attempted to add active carbon and a phosphorus flame retarder to a viscose in a usual manner and then to regenerate cellulose, but the resulting regenerated cellulose composition has excellent flame retardance, but the adsorptivity is low due to incorporation of the flame retarder even if subjected to a high vacuum treatment (column 1, lines 27-46). Hiroka et al's invention is drawn to a process of producing a composition containing these components while maintaining the desired adsorption activity (paragraph bridging columns 1 and 2).

Without the present disclosure as a guide, one skilled in the art would not have combined Pieschel et al and Hiroka et al. Indeed, there was no reasonable foreseeability as to what the result would be by replacing the cellulose I of Pieschel et al with the regenerated cellulose of Hiroka et al. Nor does either reference disclose or suggest the presently-recited limitation of degree of phosphorylation. Nor could either reference have predicted the improvement in adsorption capability by using cellulose II phosphate in place of cellulose I phosphate, as shown in Example 1 herein, and the data in Tables 1-3, in the specification at [0030]-[0035]. Similar results by comparing cellulose I phosphate to cellulose II phosphate are also shown in Examples 2-6, described in the specification beginning at [0036].

For all the above reasons, it is respectfully requested that this rejection be withdrawn.

The rejection of Claims 1-8 under 35 U.S.C. § 103(a) as unpatentable over CA 868344 (Clermont et al) in view of Pieschel et al, is respectfully traversed.

Clermont et al is directed to a process of introducing phosphorus into cellulose material which contains some free hydroxyl groups particularly cellulose derivatives (page 1, lines 1-3). Clermont et al discloses further that the “higher phosphorus content products have useful ion-exchange properties” (page 3, lines 4-5). However, Clermont et al discloses nothing with regard to adsorption of metal ions, nor does Clermont et al disclose or suggest the presently-recited phosphorylation degree.

The disclosures and deficiencies of Pieschel et al have been discussed above. Pieschel et al does not remedy the deficiencies in Clermont et al. Thus, analogous to the discussion above with regard to the rejection over Pieschel et al in view of Hiroka et al, there was no reasonable foreseeability of the metal adsorption properties obtainable by replacing the cellulose I of Pieschel et al with, for example, the mercerized or aged alkali cellulose of Clermont et al. In addition, the above-discussed comparative data in the specification is also

relevant to the present rejection. Thus, one skilled in the art could not have predicted these results based on the combination of Clermont et al and Pieschel et al.

For all the above reasons, it is respectfully requested that this rejection be withdrawn.

The rejection of Claims 1-8 under 35 U.S.C. § 112, second paragraph, is respectfully traversed. Indeed, the rejection would now appear to be moot in view of the above-discussed amendment. On the other hand, if the rejection is premised on a finding that the amount of carbamidation is indefinite, Applicants response is that there is no criticality regarding the amount, although an amount is preferred, as claimed in new Claim 10, and that one skilled in the art could determine applicable amounts of carbamidation. Accordingly, it is respectfully requested that this rejection be withdrawn.

All of the presently-pending claims in this application are now believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

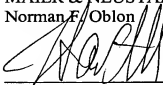
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